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Preparation of Perishables for Market.

By the Markets Division of the Committee of Food Production and Conservation
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Proper grading and packing of fruits and vegetables often means the difference between profit and loss. Dealers assure us that goods handled in the following manner will be given preference by the trade.

POTATOES

Potato digging begins in Minnesota early in August and continues until about October 15, when most of the potatoes are in storage. Potatoes should remain in the ground for a week or ten days after the vines have died down or have been killed by frost in order that they may fully mature.

They may be dug either with a fork, a plow or a potato digger. The fork method is too slow to be practical except where only a few potatoes are raised. The plow cuts some potatoes, but it is chiefly objectionable because it either fails to dig deep enough or it covers those thrown out too deep to be readily seen. The digger also cuts and injures many potatoes, but the economy of the machine method fully warrants its use. Co-operative ownership of a potato digger by small growers is very advantageous and provides probably the best method of digging where potatoes are grown in small quantities. After digging, potatoes should lie for an hour or so to allow the surface moisture to dry.

The handling of potatoes should be minimized as much as possible to avoid bruising and scratching. Wooden baskets or crates are the best containers for picking up potatoes, as they lessen the possibility of injury in handling. Many farmers prefer to pit them in the field and haul them later, but if this method is used, care should be taken that the piles are sufficiently covered to prevent freezing at night and sunburn during the day.

The piles should be removed from the field as soon as possible after digging is completed because of uncertain weather conditions. The best method, perhaps, is to sack the potatoes in the field and haul them directly to the storehouse each afternoon. This reduces the possibility of injury, which is very great to potatoes dumped loose into a wagon and shoveled into a bin. It is also superior to the other method as it saves one handling of the crop.

Whatever the method of disposition, the potatoes should be run over a grader, but in no case should it be less than 1⅝ inches in size. Rural New Yorker, King, and Green Mountain potatoes are best run over a 2-inch screen; Burbanks and Russets, a 1¾-inch screen; and Ohios, Irish Cobblers, and Triumphs a 1⅝-inch screen. In general, round varieties should be run over a 1⅞-inch grader and long varieties over a 1¾-inch. The man who does the grading can do the sorting at the same

time. Sunburned, knotty, cut, bruised, frozen, or diseased stock should neither go into the bin nor be offered for sale. The earth often adhering to potatoes raised on clay soils also falls off during the process of grading, and thus enhances their value.

While no distinct grades of potatoes are recognized on the market as such, the potato trade discounts potatoes which do not come up to standard. They are graded on the market according to uniformity of size, distinctions of variety, and freedom from disease. Mixed potatoes, that is, varieties mixed together, usually bring from 5 to 15 cents per bushel less than straight varieties; consequently it is important that the varieties should be kept separate.

It is recommended that two grades of potatoes be made. Grade 1 should be screened according to variety as mentioned above, and should be uniform in size. They should weigh on an average about nine ounces, should be firm, clean, smooth, true to type, free from disease, and have shallow eyes. Grade 2 should be at least an inch and a half in diameter, fairly uniform in size and variety, and practically free from diseased or injured potatoes.

If the potatoes are not well matured they should not be put into bins immediately, but allowed to sweat and dry out on the barn floor or any dry place where there is good ventilation. Another method which is satisfactory if the potatoes are not too immature, is to insert ventilating division walls throughout the piles. These may be 2x4 uprights on the 2-inch face of which are nailed ⅞x4-inch strips of any desired length, leaving a 1-inch space between each strip. Putting these in the bin as it is filled from 5 to 6 feet apart provides good ventilation.

The root cellar should be well ventilated and kept at a low temperature and humidity, which is automatically regulated by the temperature. The bin should be kept dark and during storage at a temperature of from 34 to 36 degrees. The temperature should be lowered as quickly as possible after the potatoes are stored. This may be done by closing all windows, doors, and ventilators during the day and opening them at night.

The trade that uses Minnesota potatoes is accustomed to receive them in even-weight 2½ bushel sacks. Each sack should be weighed individually on a small scale set at 151 pounds.

New sacks add to the appearance and value of a car of potatoes, and while they are very high at the present time they are preferable to second-hand ones and will tend to bring a better price for the potatoes. Sacks should be sewed neatly and in such a way that the potatoes will not drop out when they are handled.

If more than one variety is loaded into a car, each sack should be tagged showing the variety it contains, and each variety should be piled separately in the car. The potatoes should be piled neatly in tiers of a certain number of sacks each, and high enough that it will not be necessary to pile any potatoes between the doors. In cold weather, when it is necessary to put a stove in the car to protect the potatoes from freezing, the stove is put between the doors with the pipe going out through a false door and thence up a little above the roof of the car.

Of course, in cold weather potatoes should be loaded in refrigerator cars only and should be loaded on a false floor, from 4 to 6 inches higher than the main floor of the car. The supports to the false floor run lengthwise of the car to permit the heat from the stove to circulate under the whole load.

ONIONS

Minnesota onions are harvested late in August and in September. In normal years the tops turn yellow and fall over, but this may not occur if there is an overabundant supply of moisture in the ground, in which case ripeness is indicated by the roots dying and leaving the bulbs loose and almost ready to fall over.

It is highly important that onions be harvested when the roots loosen, as after 10 or 15 days they begin to send out new roots and later new shoots, which are known as second growth. This is very injurious as it makes the onions inferior and impairs their keeping qualities.

The method of harvesting and curing onions affects materially their quality and price on the market. A U-shaped wheel plow is run under the onions to loosen them from the ground. They are then pulled out by hand and three or four rows are thrown into a single windrow. They are allowed to remain for a day or two until the tops wilt, and are then cut off from 1 inch to 1½ inches from the bulb with shears or a knife. The bulbs of two windrows are then thrown into one row and the tops, together with the rotted onions, are thrown into windrows in the opposite direction. The onions are allowed to lie in rows for two or three days, but are turned over each day with a wooden rake until they are hauled in. If the weather is quite hot they should be covered with straw or hauled in immediately to avoid sunburn.

The onions are put in racks in a drying shed not over one foot deep. Here they are left for a week or ten days when they are run through a sorter with slats 1½ inches apart. All onions less than 1½ inches in diameter are thrown out; second growth, sunburned, or injured stock is picked out and the outer peels are knocked off, leaving a marketable product. When the onions are properly cured, they have a good luster and color and sound like wooden blocks when dropped from one crate to another.

Onions may also be cured in crates. They are brought from the field, dumped into crates which are put in open sheds, and kept there until dry.

If the onions are not to be sold at once they should be put into a storehouse and either left in open crates or put on shelves or racks. The storehouse or cellar need not be dark, but it must be dry and well ventilated. The temperature of the storehouse should be lowered immediately after storage. This is done by closing all doors, windows, and ventilators during the day and opening them at night. Onions must not freeze, but the temperature can fall to 30 degrees before injury is done. The best temperature is from 34 to 40 degrees, Fahrenheit.

Onions are sold in 100-pound sacks. If they have been stored in sacks they should be emptied out and resacked to knock off excessive peels and make a good looking product. They should be re-weighed, as onions shrink considerably in storage. Only one grade of onions is recognized on the market altho it is necessary that the onions be as uniform in size as possible. Every sack should contain the same variety and if different varieties are sold together each sack should be tagged.

BEANS

Beans should be harvested soon after the pods have turned yellow, but before they have become dead ripe. The method of harvesting depends largely upon the acreage. If only a few acres are planted it may not be profitable to buy a bean harvester—which costs about $30—altho this is doubtful when labor is so scarce. Where several farmers raise only a few acres each, it would be profitable to buy a machine co-operatively.

The bean harvester cuts the beans off at or below the surface of the ground and leaves two rows in one windrow. The windrows are usually forked together into one large windrow and bunched. They are allowed to remain in bunches until cured, when they are stacked or hauled to the barn. It is very important that beans be thoroughly dry, as they heat and mold easily when improperly cured. If wet weather comes on, the bunches must be turned over frequently to prevent those on the bottom from decaying. If only a few acres are raised, the beans may be hand pulled and afterward handled in the same manner as with the harvester.

Threshing is sometimes done directly from the field, but there is danger that the beans have not gone through the sweat, and in that case they must be closely watched in storage. If the beans are put in the barn they may be threshed at any convenient time after curing, but threshing is often left for the winter when work is light. Three general methods of threshing are practiced. The flail is ordinarily used if the quantity of beans is small, and some bean-raisers claim that the saving of beans compensates for the slower work. The beans are then run through a fanning mill and the earth and weed seeds blown out.

The ordinary threshing machine is commonly used after proper adjustments have been made, but this method is objectionable because so many beans are broken. The best work is probably done by the special bean thresher built much like a grain separator, but this machine is profitable only in bean-growing sections.

After the beans have been threshed they contain much refuse that must be removed. This must be done by hand picking methods, and is necessary in order to make the beans marketable. Discolored and damaged beans, gravel and trash of various sorts must be cleaned out. This is usually done at the elevators where the beans are sold. Here the beans are sampled, the sample picked over, weighed again, and a price paid according to the percentage of clean beans. Beans should never be shipped uncleaned, as they are not marketable in this condition. Cleaning is expensive at the place of sale to say nothing of the loss of freight on bad stock.

If several farmers are raising a relatively large acreage of beans, it seems that a co-operative bean cleaner would be highly practical. The machine consists of a hopper and a wide, moving belt upon which the beans fall and are carried to the sacks in the rear. Refuse is picked out as the beans pass over the belt. The cost of such a machine is about $30, and the power to run it could be easily procured in the neighborhood. The home-picked beans may be sold to the local dealer or shipped to a commission firm. In the latter case, seamless sacks should be used. They should be well-sewed and contain from 160 to 175 pounds.

CABBAGE

Summer cabbage is unfit for winter use, and until it has been exhausted, late cabbage should not be offered on the market. Holland or Danish Ball Head is the best variety for winter storage and use. It matures early in October. Maturity is best indicated when the bulbs forming on the stalk just below the head become pronounced.

A typical method of harvesting is here presented. Cutting is done by hand. The outside spreading leaves are stripped down and with a slashing knife the heads are cut from the stalks leaving the stalk in the ground. Two rows are cut at one time and piled together on one side. The two adjoining rows are cut in like manner and thrown in the same windrow, making a windrow of four rows. If the cabbage is to be hauled to market it is taken from the field at once, but if it is to be stored it is left on the ground for a day or two.

The cabbage is hauled from the field in a deep, wide wagon box. Care should be taken not to throw the heads into the wagon too hard. Sometimes they are tossed to a man in the wagon who carefully loads them, but this is not necessary if loading is begun carefully. From two to three tons of cabbage can be hauled in a load without injuring the cabbage.

If cabbage is to be shipped, much care should be taken that the car is properly loaded, as cabbage heats very readily. If the weather permits, a clean stock-car is best, but in any case there should be sufficient ventilation to prevent heating. Cabbage crates put on end through the center and at the ends of the car serve as adequate ventilators. Cabbage should not be shipped in crates. It should be neatly packed

in the car with the heads up. The depth should not exceed 6 feet. False doors should be put in the car to permit the maximum use of the car. Not over 12 tons should be shipped in one car.

Cabbage may be kept in a light or dark cellar, but in the latter it is likely to bleach. If avoidable, it should not be stored in piles, as enough ventilation is not secured and the cabbage soon spoils. It should be placed either in crates or on shelves, the latter being preferable altho more expensive. The crates, which are 17x17x34 inches, may be piled one upon another. When shelves are used, only one layer of cabbage should be put on a shelf. Shelves should be made with spaces between the boards to provide circulation. The distance between the shelves need not be greater than the size of the cabbage. The cellar should be moist, but the humidity should never reach the saturation point. For best results the temperature should be kept between 32 and 35 degrees.

Care must be taken that all cabbage put into storage is sound. The heads should not be abnormally large because they are discounted on the market. If cabbage is not shipped until cold weather, great care must be taken in loading to prevent it from freezing. Refrigerator cars should always be used for winter shipping. Cabbage held for winter shipment should reach the market before March to prevent competition with the new southern and western crops.

Cabbage, like other vegetables, is not standardized altho buyers recognize a prime grade. This prime grade includes stock that is firm, uniform in size, and free from rotten and broken heads. If a lot or shipment does not come up to these standards it must necessarily fall into a second grade and sell for a lower price.

ROOT CROPS

Root crops in general are handled and marketed in much the same manner. They mature in late fall, and, except carrots, need not be harvested until after several frosts. If it is desired to keep roots in storage, the same cellar may be used as for potatoes, and the same precautions regarding temperature and ventilation must be observed. The tops and roots should all be trimmed off at the stem and any which are defective should be thrown out. Care must be taken that the roots do not heat. This can be prevented by not using too large a bin and by having proper ventilation. To prevent wilting, a thin layer of sawdust or a layer of straw and one of sawdust may be put over them.

Root crops have no market standard. The trade demands certain requirements for prime grades and for those lots falling below these requirements, a lower price must be taken. In general, the trade demands that roots be of good quality, clean, and uniform in size and variety.

RUTABAGAS

Rutabagas may be among the last root crops harvested as a slight freeze will not injure them, but it is safer to harvest them before being frozen.

Harvesting is much the same as with onions. The roots are pulled by hand and piled in windrows. Two rows are thrown in one, the roots and tops are cut off with a knife, the body of the turnip being thrown one way and the leaves and roots the other. The same is done with the adjoining two rows except that they are thrown in the opposite direction, making four rows of roots in one large windrow. They are marketed in 140-pound sacks.

TURNIPS

Turnips are handled like rutabagas, but do not keep so long and should be disposed of early. They are also somewhat less resistant to frost and should be harvested earlier.

BEETS

Beets are also less resistant than rutabagas, but otherwise they are handled in the same manner They should be uniform in size and color and should be packed the same as rutabagas

PARSNIPS

Parsnips are as resistant as rutabagas and are handled in the same way Parsnips bring best prices if held until late in the season and may well be stored for sale in the winter They should be uniform as possible and well cleaned

CARROTS

Carrots are the most tender of all the root crops and must be harvested before a heavy frost Carrots indicate maturity by their slightly yellowish leaves and a readiness for them to break off when pulled The Danvers Half Long is the best keeping variety Carrots should be harvested in dry weather and keep best when not too ripe To avoid heating they should be put in bins not more than 3 feet wide and 6 feet high They heat very readily because of their small size and compactness when in storage When sold, carrots like other root crops should be put in 140 pound sacks and sold in uniform lots

APPLES

A satisfactory price for apples depends largely upon the methods of picking, grading, and packing The same general rules regarding condition and uniformity of size and variety hold with apples as with other perishables They should be picked when the seeds turn brownish or black when a rich color comes on the fruit exposed to the sunlight, and the apple yields slightly to the touch, and when the apples fall to the ground and the stems snap readily from the spur when the fruit is twisted upward

All fruit should be carefully picked from the tree by hand into padded baskets or pails to prevent bruising This takes more time but it must be remembered that apples without bruises and punctures look, keep, sell, and taste best A simple twisting movement up and down on the fruit removes it from the spur without pulling out the stem Early varieties should be picked before becoming fully ripe The term 'hard ripe' is used to designate the condition desired and means that the fruit has reached its full size and is more or less colored The fruit should be put under cover as soon as it is picked, so that it can cool before packing

Only one variety and grade should be put in a package In the grade specifications given, normal shape refers to the general form of well grown specimens of the variety in question For instance, the Wealthy is regular in outline and nearly round while the Hibernal is somewhat flat and often irregular The color also should be typical of the variety, whether it is green, yellow, or red Red apples usually sell better than green or yellow varieties, altho the quality may even be poorer Fruit showing the effects of insects or diseases cannot be classed as well grown, and must be discounted or entirely thrown out on the market Spraying early in the season will prevent most injuries from insects and diseases Grading as to size is very important Grades cannot usually be specified because grading depends much upon the variety and season Only apples which are above a selected minimum size, as 2½ inches, the diameter considered at right angles to the stem, should be put into the same package Apples are regarded as defective when they are not up to grade in size, color, or shape or when they are bruised, punctured or diseased

Grades of Minnesota apples have not been well standardized, but the market recognizes certain qualities as characteristic of first class apples It is recommended

that two grades be made The first is A grade and consists of apples that have been hand picked, are of normal shape, and at least one third of which are colored They must be free from dirt, disease, and insect injuries, and must be well packed The limit of defects allowed should be not more than 10 per cent of all kinds or 5 per cent of any one kind B grade should also be hand picked, properly packed, and practically normal in shape They may be somewhat smaller than A grade, but should be free from earth, disease, and insect injuries The limit of defects allowed is not more than 15 per cent of all, or 5 per cent of any one kind

The common packing for Minnesota apples is the regular apple barrel For local markets bushel or half bushel baskets may be used Boxes are used only for the very choicest fruit, and are practical for very few Minnesota apples Sacks or dirty and stained packages should never be used The following rules may be followed in packing barrels The new barrel should be put on a firm foundation, the head removed, and one or two layers of evenly graded apples put on the bottom with the stems turned down These are the 'facers, and this end becomes the top of the finished barrel The rest of the barrel should be filled with graded apples direct from the packing table or picking baskets Apples should never be put on edge, and large or small apples should not be used to fill up space

After each half bushel has been added the barrel should be shaken enough to settle the fruit into place, but not enough to bruise it When the barrel is nearly full, the top should be evened off with a layer with the stems up The barrel should be filled even with or above the chimes, depending upon the variety and maturity of the fruit Put the head over the top of the barrel and press it down into place by means of a screw or lever press It is absolutely necessary to press the apples tight enough to keep them in place, in order to prevent bruising while in transit After the head has been securely nailed, the variety, grade, size of the smallest apple, and the grower s or packer s name should be marked upon the top of the barrel